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|---|----------------|------------------|-----------------------|---|------------------------|------------------|------------------|------------------|---------------------|------------------|------------|
| Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy  |                |                  |                       |   |                        |                  |                  |                  | DATE: February 2010 |                  |            |
| APPROPRIATION/BUDGET ACTIVITY<br>1319: Research, Development, Test & Evaluation, Navy<br>BA 5: Development & Demonstration (SDD)  |                |                  |                       | R-1 ITEM NOMENCLATURE<br>PE 0604562N: Submarine Tactical Warfare System |                        |                  |                  |                  |                     |                  |            |
| COST (\$ in Millions)   | FY 2009 Actual | FY 2010 Estimate | FY 2011 Base Estimate | FY 2011 OCO Estimate  | FY 2011 Total Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate    | Cost To Complete | Total Cost |
| Total Program Element   | 64.526         | 67.024           | 50.537                | 0.000   | 50.537                 | 53.826           | 54.757           | 55.997           | 57.152              | Continuing       | Continuing |
| 0236: SSN Comb Cont Sys Imprvmnt (ENG)  | 56.548         | 59.455           | 50.537                | 0.000   | 50.537                 | 53.826           | 54.757           | 55.997           | 57.152              | Continuing       | Continuing |
| 9999: Congressional Adds  | 7.978          | 7.569            | 0.000                 | 0.000   | 0.000                  | 0.000            | 0.000            | 0.000            | 0.000               | 0.000            | 27.406     |
| A. Mission Description and Budget Item Justification  |                |                  |                       |   |                        |                  |                  |                  |                     |                  |            |
| <p>Project Unit 0236: This program develops Commercial-Off-The-Shelf (COTS) based software and hardware upgrades to integrate improved tactical and weapons control capabilities for multiple submarine Classes (SSN688, SSGN, SEAWOLF, and VIRGINIA (Post Shakedown Availability). The AN/BYG-1 is the combat control system common across submarine platforms which incorporates tactical control, weapon control and tactical Local Area Network (LAN) functions into a single development program. The hardware upgrades (technology insertions (TI's) are developed on a biennial basis to provide improved capability and address COTS obsolescence. Funding also accommodates the biennial integration of software Advanced Processing Builds (APBs) for both tactical control (APB(T) and weapon control (APB(W)) subsystems. The tactical control integration effort incorporates the integration of other sensor (ESM, sonar, radar, etc.) inputs to provide a common operation picture and improved situational awareness in an information assurance (IA) compliant environment. The weapon control development effort provides improvements to the weapons control subsystem based on improvements to missiles and torpedoes. AN/BYG-1 allows the submarine Navy to rapidly update the ship safety tactical picture, integrates the common tactical picture into the battlegroup, improves torpedo interfaces and provides Tactical TOMAHAWK (TOMAHAWK Block IV) capability.</p> <p>This program also develops and tests a Common Weapon Launcher, a COTS-based software weapons launch capability for Virginia Class submarines. This upgrade provides a more reliable capability for launching missiles and torpedoes from submarines while providing the architecture to support the introduction of the next generation of payloads and sensors. This new design will also reduce the recurring costs of VA Class submarine weapon launch systems.</p> <p>Project Unit 9999 is comprised of FY09 congressional adds for Submarine Maintenance Automation and Communication System, Advanced Tactical Control System, Water Space Management Navigation Decision Aid and Submarine Environment for Evaluation and Development. FY10 congressional adds for Artificial Intelligence-Based Combat System Kernel, Submarine System Biometrics Access Control and Submarine Environment for Evaluation and Development.</p> |                |                  |                       |   |                        |                  |                  |                  |                     |                  |            |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy                                      |         |  |              | DATE: February 2010 |               |
| APPROPRIATION/BUDGET ACTIVITY   |         | R-1 ITEM NOMENCLATURE                          |              |                     |               |
| 1319: Research, Development, Test & Evaluation, Navy<br>BA 5: Development & Demonstration (SDD) |         | PE 0604562N: Submarine Tactical Warfare System |              |                     |               |
| B. Program Change Summary (\$ in Millions)  |         |  |              |                     |               |
|   | FY 2009 | FY 2010  | FY 2011 Base | FY 2011 OCO         | FY 2011 Total |
| Previous President's Budget   | 66.364  | 59.703   | 0.000        | 0.000               | 0.000         |
| Current President's Budget  | 64.526  | 67.024   | 50.537       | 0.000               | 50.537        |
| Total Adjustments   | -1.838  | 7.321  | 50.537       | 0.000               | 50.537        |
| • Congressional General Reductions  |         | -0.279   |              |                     |               |
| • Congressional Directed Reductions   |         | 0.000  |              |                     |               |
| • Congressional Rescissions   | 0.000   | 0.000  |              |                     |               |
| • Congressional Adds  |         | 7.600  |              |                     |               |
| • Congressional Directed Transfers  |         | 0.000  |              |                     |               |
| • Reprogrammings  | 0.000   | 0.000  |              |                     |               |
| • SBIR/STTR Transfer  | -1.838  | 0.000  |              |                     |               |
| • Program Adjustments   | 0.000   | 0.000  | 50.537       | 0.000               | 50.537        |
| Congressional Add Details (\$ in Millions, and Includes General Reductions)                     |         |  |              |                     |               |
| Project: 9999: Congressional Adds   |         |  |              |                     |               |
| Congressional Add: Artificial Intelligence-Based Combat System Kernel                           |         |  |              |                     |               |
| Congressional Add: Submarine System Biometrics Access Control                                   |         |  |              |                     |               |
| Congressional Add: SUBMARINE MAINTENANCE AUTOMATION AND COMMUNICATION                           |         |  |              |                     |               |
| Congressional Add: Advanced Tactical Control System   |         |  |              |                     |               |
| Congressional Add: Submarine Environment for Evaluation and Developme                           |         |  |              |                     |               |
| Congressional Add: Water Space Management Navigation Decision Aid                               |         |  |              |                     |               |
| Congressional Add Subtotals for Project: 9999   |         |  |              |                     |               |
| Congressional Add Totals for all Projects   |         |  |              |                     |               |
| Change Summary Explanation  |         |  |              |                     |               |
| Technical: Not applicable.  |         |  |              |                     |               |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy   |   | DATE: February 2010 |
| APPROPRIATION/BUDGET ACTIVITY<br>1319: Research, Development, Test & Evaluation, Navy<br>BA 5: Development & Demonstration (SDD)                                 | R-1 ITEM NOMENCLATURE<br>PE 0604562N: Submarine Tactical Warfare System |                     |
| <p>Schedule: Not applicable.</p> <p>FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.</p> |   |                     |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy   |                           |                             |                                      |   |                                       |                             |                             | <b>DATE:</b> February 2010                                      |                             |                             |                       |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i>  |                           |                             |                                      | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604562N: <i>Submarine Tactical Warfare System</i> |                                       |                             |                             | <b>PROJECT</b><br>0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i> |                             |                             |                       |
| <b>COST (\$ in Millions)</b>   | <b>FY 2009<br/>Actual</b> | <b>FY 2010<br/>Estimate</b> | <b>FY 2011<br/>Base<br/>Estimate</b> | <b>FY 2011<br/>OCO<br/>Estimate</b>   | <b>FY 2011<br/>Total<br/>Estimate</b> | <b>FY 2012<br/>Estimate</b> | <b>FY 2013<br/>Estimate</b> | <b>FY 2014<br/>Estimate</b>                                     | <b>FY 2015<br/>Estimate</b> | <b>Cost To<br/>Complete</b> | <b>Total<br/>Cost</b> |
| 0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i>  | 56.548                    | 59.455                      | 50.537                               | 0.000   | 50.537                                | 53.826                      | 54.757                      | 55.997  | 57.152                      | Continuing                  | Continuing            |
| Quantity of RDT&E Articles   | 0                         | 0                           | 0                                    | 0   | 0                                     | 0                           | 0                           | 0   | 0                           |                             |                       |
| <b>A. Mission Description and Budget Item Justification</b><br><p>Project Unit 0236: This program develops Commercial-Off-The-Shelf (COTS) based software and hardware upgrades to integrate improved tactical and weapons control capabilities for multiple submarine Classes (SSN 688, SSGN, SEAWOLF, and VIRGINIA (Post Shakedown Availability). The AN/BYG-1 is the combat control system common across submarine platforms which incorporates tactical control, weapon control and tactical Local Area Network (LAN) functions into a single development program. The hardware upgrades (technology insertions (TI's) are developed on a biennial basis to provide improved capability and address COTS obsolescence. Funding also accommodates the biennial integration of software Advanced Processing Builds (APBs) for both tactical control (APB T) and weapon control (APB W) subsystems. The tactical control integration effort incorporates the integration of other sensor (ESM, sonar, radar, etc.) inputs to provide a common operation picture and improved situational awareness in an information assurance (IA) compliant environment. The weapon control development effort provides improvements to the weapons control subsystem based on improvements to missiles and torpedoes. AN/BYG-1 allows the submarine Navy to rapidly update the ship safety tactical picture, integrates the common tactical picture into the battlegroup, improves torpedo interfaces and provides Tactical TOMAHAWK (TOMAHAWK Block IV) capability.</p> <p>This program also develops and tests a Common Weapon Launcher, a COTS-based software weapons launch capability for Virginia Class submarines. This upgrade provides a more reliable capability for launching missiles and torpedoes from submarines while providing the architecture to support the introduction of the next generation of payloads and sensors. This new design will also reduce the recurring costs of VA Class submarine weapon launch systems.</p> |                           |                             |                                      |   |                                       |                             |                             |   |                             |                             |                       |
| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>   |                           |                             |                                      |   |                                       |                             |                             |   |                             |                             |                       |
|  |                           |                             |                                      |   |                                       | <b>FY 2009</b>              | <b>FY 2010</b>              | <b>FY 2011<br/>Base</b>   | <b>FY 2011<br/>OCO</b>      | <b>FY 2011<br/>Total</b>    |                       |
| Advanced Processor Builds  |                           |                             |                                      |   |                                       | 26.254                      | 25.030                      | 25.378  | 0.000                       | 25.378                      |                       |

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| Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy   |  |   |         | DATE: February 2010                               |             |               |
| APPROPRIATION/BUDGET ACTIVITY<br>1319: Research, Development, Test & Evaluation, Navy<br>BA 5: Development & Demonstration (SDD)  |  | R-1 ITEM NOMENCLATURE<br>PE 0604562N: Submarine Tactical Warfare System |         | PROJECT<br>0236: SSN Comb Cont Sys Imprvmnt (ENG) |             |               |
| B. Accomplishments/Planned Program (\$ in Millions)   |  |   |         |   |             |               |
|   |  | FY 2009   | FY 2010 | FY 2011 Base                                      | FY 2011 OCO | FY 2011 Total |
| FY 2009 Accomplishments:<br>Completed APB-07 integration into AN/BYG-1 baseline. Completed integration of APB-09 into AN/BYG-1 (TI08) baseline. One capability for delivery, will be the ability to operate the TOMAHAWK Weapon System at the SECRET level, while maintaining the ability to operate at the TOP SECRET level if the need arises.      |  |   |         |   |             |               |
| FY 2010 Plans:<br>Complete APB-09 integration into AN/BYG-1 (TI10) baseline. Support development of APB-11 into AN/BYG-1 baseline.  |  |   |         |   |             |               |
| FY 2011 Base Plans:<br>Continue development of APB-11 into AN/BYG-1 baseline.   |  |   |         |   |             |               |
| AN/BYG-1 TI-08  |  | 10.637  | 3.183   | 0.000   | 0.000       | 0.000         |
| FY 2009 Accomplishments:<br>Completed development, integration and test of the next generation AN/BYG-1 (TI08) for SSN 688/Seawolf/Virginia Class submarines scheduled for initial delivery in FY09.  |  |   |         |   |             |               |
| FY 2010 Plans:<br>Complete development, integration and test of the next generation AN/BYG-1 (TI08) for SSN 688/Seawolf/Virginia Class submarines scheduled for final delivery in FY10.   |  |   |         |   |             |               |
| AN/BYG-1 TI-10  |  | 6.875   | 13.482  | 6.616   | 0.000       | 6.616         |
| FY 2009 Accomplishments:<br>Completed development, integration and test of the next generation AN/BYG-1 (TI10) for SSN 688/SSGN/VA Class submarines. One capability for delivery will include hardware improvements to provide the Officer of the Deck improved situational awareness, particularly in the area of navigation and contact management. |  |   |         |   |             |               |

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| Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy  |  |   |         | DATE: February 2010                               |             |               |
| APPROPRIATION/BUDGET ACTIVITY<br>1319: Research, Development, Test & Evaluation, Navy<br>BA 5: Development & Demonstration (SDD)   |  | R-1 ITEM NOMENCLATURE<br>PE 0604562N: Submarine Tactical Warfare System |         | PROJECT<br>0236: SSN Comb Cont Sys Imprvmnt (ENG) |             |               |
| B. Accomplishments/Planned Program (\$ in Millions)  |  |   |         |   |             |               |
|  |  | FY 2009   | FY 2010 | FY 2011 Base                                      | FY 2011 OCO | FY 2011 Total |
| FY 2010 Plans:<br>Continue development, integration and test of the next generation AN/BYG-1 (TI10) for SSN 688/SSGN/VA Class submarines.  |  |   |         |   |             |               |
| FY 2011 Base Plans:<br>Complete development, integration and test of the next generation AN/BYG-1 (TI10) for SSN 688/SSGN/VA Class submarines.   |  |   |         |   |             |               |
| AN/BYG-1 TI-12   |  | 0.000   | 2.660   | 6.001   | 0.000       | 6.001         |
| FY 2010 Plans:<br>Begin engineering development process for selection and prototyping of new technologies.   |  |   |         |   |             |               |
| FY 2011 Base Plans:<br>Continue development process for selection and prototyping of new technologies.   |  |   |         |   |             |               |
| Testing  |  | 6.000   | 4.000   | 6.000   | 0.000       | 6.000         |
| FY 2009 Accomplishments:<br>Completed DT/OT for AN/BYG-1 TI08 and APB-07 on 688 Class/SSGN/Seawolf/VA Class submarines.  |  |   |         |   |             |               |
| FY 2010 Plans:<br>Complete DT/OT for AN/BYG-1 TI08 and APB-07 on 688 Class/SSGN/Seawolf/VA Class submarines.<br>Begin DT/OT for AN/BYG-1 APB-09 on 688 Class/SSGN/VA Class submarines. |  |   |         |   |             |               |
| FY 2011 Base Plans:<br>Complete DT/OT for AN/BYG-1 APB-09 on 688 Class/SSGN/VA Class submarines. Begin DT/OT for AN/BYG-1 TI-10 on 688 Class/SSGN/Seawolf/VA Class submarines.         |  |   |         |   |             |               |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy  |                |   |                     | <b>DATE:</b> February 2010                                      |                      |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i>   |                | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604562N: <i>Submarine Tactical Warfare System</i> |                     | <b>PROJECT</b><br>0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i> |                      |
| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>  |                |   |                     |   |                      |
|   | <b>FY 2009</b> | <b>FY 2010</b>  | <b>FY 2011 Base</b> | <b>FY 2011 OCO</b>  | <b>FY 2011 Total</b> |
| Information Assurance (IA)<br><i>FY 2010 Plans:</i><br>Develop and Integrate IA Toolkit and conduct IA Certification Testing on BYG-1 TI-10.<br><br><i>FY 2011 Base Plans:</i><br>Continue integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-10.  | 0.000          | 6.100   | 6.542               | 0.000   | 6.542                |
| Common Weapon Launcher (CWL)<br><i>FY 2009 Accomplishments:</i><br>Completed integration of CWL with AN/BYG-1 TI-10 on VA Class submarines.<br><br><i>FY 2010 Plans:</i><br>Complete integration of CWL with AN/BYG-1 TI-10 on VA Class submarines.   | 6.500          | 5.000   | 0.000               | 0.000   | 0.000                |
| Acquisition Workforce<br><i>FY 2009 Accomplishments:</i><br>DAWDF   | 0.282          | 0.000   | 0.000               | 0.000   | 0.000                |
| Accomplishments/Planned Programs Subtotals  | 56.548         | 59.455  | 50.537              | 0.000   | 50.537               |
| <b>C. Other Program Funding Summary (\$ in Millions)</b><br>N/A   |                |   |                     |   |                      |
| <b>D. Acquisition Strategy</b><br>This budget integrates APBs developed by the advanced development community.<br>This program has been tailored in accordance with the new DoD5000 directive to incorporate annual MDA production reviews.<br>Advanced Processing Builds (APB) products associated with AN/BYG-1 Release-To- Fleet 3Q 2009, 3Q 2011, 3Q 2013 and 3Q 2015.<br>Follow-On contracts for both tactical and weapons control subsystems were awarded in July 2009. |                |   |                     |   |                      |

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| Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy  |  | DATE: February 2010                                      |
| APPROPRIATION/BUDGET ACTIVITY<br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i>   | R-1 ITEM NOMENCLATURE<br>PE 0604562N: <i>Submarine Tactical Warfare System</i> | PROJECT<br>0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i> |
| <p><b>E. Performance Metrics</b></p> <p>AN/BYG-1 Submarine Combat and Weapon Control System performance metrics for each Advanced Processor Build (APB) and Technology Insertion (TI) cycle are contained in the classified Capability Production Document (CPD) annex to the overarching system requirements as laid out in the Capabilities Development Document (CDD). Each APB cycle receives an updted CPD based on fleet desired capabilities.</p> |  |  |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy   |                        |   |                        |         |   |                 |            |                |            |   | DATE: February 2010 |            |                          |  |
| APPROPRIATION/BUDGET ACTIVITY<br>1319: Research, Development, Test & Evaluation, Navy<br>BA 5: Development & Demonstration (SDD) |                        |   |                        |         | R-1 ITEM NOMENCLATURE<br>PE 0604562N: Submarine Tactical Warfare System |                 |            |                |            | PROJECT<br>0236: SSN Comb Cont Sys Imprvmnt (ENG) |                     |            |                          |  |
| Product Development (\$ in Millions)   |                        |   |                        |         |   |                 |            |                |            |   |                     |            |                          |  |
|  |                        |   |                        | FY 2010 |   | FY 2011<br>Base |            | FY 2011<br>OCO |            | FY 2011<br>Total                                  |                     |            |                          |  |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location            | Total Prior Years Cost | Cost    | Award Date  | Cost            | Award Date | Cost           | Award Date | Cost  | Cost To Complete    | Total Cost | Target Value of Contract |  |
| MULTI TUBE WEAPON SIMULATOR  | Various/<br>Various    | PROGENY<br>Not Specified                  | 2.635                  | 0.000   |   | 0.000           |            | 0.000          |            | 0.000   | 0.000               | 2.635      | 2.635                    |  |
| AN/BYG-1 TECH INSERTION  | C/CPAF                 | RAYTHEON<br>PORTSMOUTH, RI                | 47.768                 | 5.582   | Oct 2009  | 2.500           | Oct 2010   | 0.000          |            | 2.500   | Continuing          | Continuing | Continuing               |  |
| AN/BYG-1 TECH INSERTION  | C/CPIF                 | GENERAL DYNAMICS (GDAIS)<br>Not Specified | 40.964                 | 19.157  | Oct 2009  | 17.016          | Oct 2010   | 0.000          |            | 17.016  | Continuing          | Continuing | Continuing               |  |
| GOVERNMENT ENGINEERING   | WR                     | NUWC<br>NEWPORT, RI                       | 68.976                 | 2.430   | Oct 2009  | 2.588           | Oct 2010   | 0.000          |            | 2.588   | Continuing          | Continuing | Continuing               |  |
| AN/BYG-1 TECH INSERTION  | Various/<br>Various    | MITRE<br>Not Specified                    | 2.429                  | 0.000   |   | 0.000           |            | 0.000          |            | 0.000   | 0.000               | 2.429      | 2.429                    |  |
| AN/BYG-1 TECH INSERTION  | C/CPIF                 | ANTEON<br>Not Specified                   | 6.000                  | 0.000   |   | 0.000           |            | 0.000          |            | 0.000   | 0.000               | 6.000      | 6.000                    |  |
| COTS HARDWARE & SOFTWARE   | C/CPAF                 | DDL OMNI<br>Not Specified                 | 8.500                  | 0.000   |   | 0.000           |            | 0.000          |            | 0.000   | 0.000               | 8.500      | 8.500                    |  |
| INFORMATION ASSURANCE  | C/CPAF                 | PROGENY<br>Not Specified                  | 0.000                  | 6.100   | Jan 2010  | 6.542           | Jan 2011   | 0.000          |            | 6.542   | 0.000               | 12.642     | 12.642                   |  |
| COMMON WEAPON LAUNCHER   | C/CPAF                 | PROGENY<br>Not Specified                  | 33.329                 | 5.000   | Jan 2010  | 0.000           |            | 0.000          |            | 0.000   | 0.000               | 38.329     | 38.329                   |  |
| Subtotal   |                        |   | 210.601                | 38.269  |   | 28.646          |            | 0.000          |            | 28.646  |                     |            |                          |  |
| Remarks  |                        |   |                        |         |   |                 |            |                |            |   |                     |            |                          |  |
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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy   |                        |  |                        |         |   |              |            |             |   |               | DATE: February 2010 |            |                          |  |
| APPROPRIATION/BUDGET ACTIVITY<br>1319: Research, Development, Test & Evaluation, Navy<br>BA 5: Development & Demonstration (SDD) |                        |  |                        |         | R-1 ITEM NOMENCLATURE<br>PE 0604562N: Submarine Tactical Warfare System |              |            |             | PROJECT<br>0236: SSN Comb Cont Sys Imprvmnt (ENG) |               |                     |            |                          |  |
| Support (\$ in Millions)   |                        |  |                        |         |   |              |            |             |   |               |                     |            |                          |  |
|  |                        |  |                        | FY 2010 |   | FY 2011 Base |            | FY 2011 OCO |   | FY 2011 Total |                     |            |                          |  |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location         | Total Prior Years Cost | Cost    | Award Date  | Cost         | Award Date | Cost        | Award Date  | Cost          | Cost To Complete    | Total Cost | Target Value of Contract |  |
| APB SOFTWARE INTEGRATION   | C/CPAF                 | RAYTHEON PORTSMOUTH, RI                | 42.466                 | 2.000   | Oct 2009  | 1.977        | Oct 2010   | 0.000       |   | 1.977         | Continuing          | Continuing | Continuing               |  |
| APB SOFTWARE INTEGRATION   | C/CPIF                 | GENERAL DYNAMICS (GDAIS) Not Specified | 38.689                 | 8.596   | Oct 2009  | 7.194        | Oct 2010   | 0.000       |   | 7.194         | Continuing          | Continuing | Continuing               |  |
| APF SOFTWARE INTEGRATION   | WR                     | NUWC NEWPORT, RI                       | 24.388                 | 5.590   | Oct 2009  | 5.720        | Oct 2010   | 0.000       |   | 5.720         | Continuing          | Continuing | Continuing               |  |
| SOFTWARE DEVELOPMENT   | Various/ Various       | VARIOUS Not Specified                  | 36.679                 | 0.000   |   | 0.000        |            | 0.000       |   | 0.000         | 0.000               | 36.679     | 36.679                   |  |
| Subtotal   |                        |  | 142.222                | 16.186  |   | 14.891       |            | 0.000       |   | 14.891        |                     |            |                          |  |
| Remarks  |                        |  |                        |         |   |              |            |             |   |               |                     |            |                          |  |
| Test and Evaluation (\$ in Millions)   |                        |  |                        |         |   |              |            |             |   |               |                     |            |                          |  |
|  |                        |  |                        | FY 2010 |   | FY 2011 Base |            | FY 2011 OCO |   | FY 2011 Total |                     |            |                          |  |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location         | Total Prior Years Cost | Cost    | Award Date  | Cost         | Award Date | Cost        | Award Date  | Cost          | Cost To Complete    | Total Cost | Target Value of Contract |  |
| DEVELOPMENT TEST & EVALUATION  | WR                     | NUWC NEWPORT, RI                       | 23,812.000             | 2.300   | Oct 2009  | 3.800        | Oct 2010   | 0.000       |   | 3.800         | Continuing          | Continuing | Continuing               |  |
| OPERATIONAL TEST & EVALUATION  | WR                     | COMOPTEVFOR Not Specified              | 15.469                 | 0.700   | Oct 2009  | 1.000        | Oct 2010   | 0.000       |   | 1.000         | Continuing          | Continuing | Continuing               |  |
|  |                        |  |                        |         |   |              |            |             |   |               |                     |            |                          |  |

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|   |                                   |   |                               |   |                   |                     |                   |   |                   |                      |                            |                   |                                 |
|---|-----------------------------------|---|-------------------------------|---|-------------------|---------------------|-------------------|---|-------------------|----------------------|----------------------------|-------------------|---------------------------------|
| <b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2011 Navy</b>   |                                   |   |                               |   |                   |                     |                   |   |                   |                      | <b>DATE:</b> February 2010 |                   |                                 |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i> |                                   |   |                               | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604562N: <i>Submarine Tactical Warfare System</i> |                   |                     |                   | <b>PROJECT</b><br>0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i> |                   |                      |                            |                   |                                 |
|   |                                   |   |                               |   |                   |                     |                   |   |                   |                      |                            |                   |                                 |
| <b>Test and Evaluation (\$ in Millions)</b>   |                                   |   |                               |   |                   |                     |                   |   |                   |                      |                            |                   |                                 |
|   |                                   |   |                               | <b>FY 2010</b>  |                   | <b>FY 2011 Base</b> |                   | <b>FY 2011 OCO</b>  |                   | <b>FY 2011 Total</b> |                            |                   |                                 |
| <b>Cost Category Item</b>   | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Total Prior Years Cost</b> | <b>Cost</b>   | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>   | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b>    | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| TEST & EVALUATION   | Various/<br>Various               | VARIOUS<br>Not Specified                  | 1.295                         | 1.000   | Oct 2009          | 1.200               | Oct 2010          | 0.000   |                   | 1.200                | 0.000                      | 3.495             | 3.495                           |
| <b>Subtotal</b>   |                                   |   | 23,828.764                    | 4.000   |                   | 6.000               |                   | 0.000   |                   | 6.000                |                            |                   |                                 |
| <b>Remarks</b>  |                                   |   |                               |   |                   |                     |                   |   |                   |                      |                            |                   |                                 |
|   |                                   |   |                               |   |                   |                     |                   |   |                   |                      |                            |                   |                                 |
| <b>Management Services (\$ in Millions)</b>   |                                   |   |                               |   |                   |                     |                   |   |                   |                      |                            |                   |                                 |
|   |                                   |   |                               | <b>FY 2010</b>  |                   | <b>FY 2011 Base</b> |                   | <b>FY 2011 OCO</b>  |                   | <b>FY 2011 Total</b> |                            |                   |                                 |
| <b>Cost Category Item</b>   | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Total Prior Years Cost</b> | <b>Cost</b>   | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>   | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b>    | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| PROGRAM MANAGEMENT SUPPORT  | C/CPFF                            | EG&G ARLINGTON, VA                        | 10.330                        | 1.000   | Oct 2009          | 1.000               | Oct 2010          | 0.000   |                   | 1.000                | 0.000                      | 12.330            | 12.330                          |
| TRAVEL  | WR                                | NAVSEA ARLINGTON, VA                      | 0.370                         | 0.000   |                   | 0.000               |                   | 0.000   |                   | 0.000                | 0.000                      | 0.370             | 0.370                           |
| ACQUISITION WORKFORCE   | Various/<br>Various               | Not Specified<br>Not Specified            | 0.282                         | 0.000   |                   | 0.000               |                   | 0.000   |                   | 0.000                | 0.000                      | 0.282             | 0.282                           |
| <b>Subtotal</b>   |                                   |   | 10.982                        | 1.000   |                   | 1.000               |                   | 0.000   |                   | 1.000                | 0.000                      | 12.982            | 12.982                          |
| <b>Remarks</b>  |                                   |   |                               |   |                   |                     |                   |   |                   |                      |                            |                   |                                 |
|   |                                   |   |                               |   |                   |                     |                   |   |                   |                      |                            |                   |                                 |

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|   |                                   |                |   |                         |  |   |                            |                          |                             |                   |   |
|---|-----------------------------------|----------------|---|-------------------------|--|---|----------------------------|--------------------------|-----------------------------|-------------------|---|
| <b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2011 Navy   |                                   |                |   |                         |  |   | <b>DATE:</b> February 2010 |                          |                             |                   |   |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i> |                                   |                | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604562N: <i>Submarine Tactical Warfare System</i> |                         |  | <b>PROJECT</b><br>0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i> |                            |                          |                             |                   |   |
|   |                                   |                |   |                         |  |   |                            |                          |                             |                   |   |
|   | <b>Total Prior<br/>Years Cost</b> | <b>FY 2010</b> |   | <b>FY 2011<br/>Base</b> |  | <b>FY 2011<br/>OCO</b>  |                            | <b>FY 2011<br/>Total</b> | <b>Cost To<br/>Complete</b> | <b>Total Cost</b> | <b>Target<br/>Value of<br/>Contract</b> |
| <b>Project Cost Totals</b>  | 24,192.569                        | 59.455         |   | 50.537                  |  | 0.000   |                            | 50.537                   |                             |                   |   |
| <b>Remarks</b>  |                                   |                |   |                         |  |   |                            |                          |                             |                   |   |

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**Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy**

**DATE:** February 2010

## APPROPRIATION/BUDGET ACTIVITY

1319: *Research, Development, Test & Evaluation, Navy*  
BA 5: *Development & Demonstration (SDD)*

## R-1 ITEM NOMENCLATURE

PE 0604562N: *Submarine Tactical Warfare System*

## PROJECT

0236: *SSN Comb Cont Sys Imprvmnt (ENG)*

| CLASSIFICATION:                          |      |   |   |                           | EXHIBIT R4, SCHEDULE PROFILE                 |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
|--|------|---|---|---------------------------|--|---|---|---------------------------|------|---|---|---------------------------|------|---|---|---------------------------|------|---|---|---------------------------|------|---|---|---------------------------|------|---|---|---------------------------|--|--|--|--|
| APPROPRIATION/BUDGET ACTIVITY            |      |   |   |                           | PROGRAM ELEMENT NUMBER AND NAME              |   |   |                           |      |   |   |                           |      |   |   |                           |      |   | PROJECT NUMBER AND NAME                     |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| RDT&E, N / BA-5                          |      |   |   |                           | 0604562N / Submarine Tactical Warfare System |   |   |                           |      |   |   |                           |      |   |   |                           |      |   | 0236 / Submarine Combat System Improvements |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
|  | 2009 |   |   |                           | 2010   |   |   |                           | 2011 |   |   |                           | 2012 |   |   |                           | 2013 |   |   |                           | 2014 |   |   |                           | 2015 |   |   |                           |  |  |  |  |
|  | 1    | 2 | 3 | 4                         | 1  | 2 | 3 | 4                         | 1    | 2 | 3 | 4                         | 1    | 2 | 3 | 4                         | 1    | 2 | 3   | 4                         | 1    | 2 | 3 | 4                         | 1    | 2 | 3 | 4                         |  |  |  |  |
| Acquisition Milestones                   |      |   |   | ▲                         |  |   |   | △                         |      |   |   | △                         |      |   |   | △                         |      |   |   | △                         |      |   |   | △                         |      |   |   | △                         |  |  |  |  |
|  |      |   |   | Annual MDA Program Review |  |   |   | Annual MDA Program Review |      |   |   | Annual MDA Program Review |      |   |   | Annual MDA Program Review |      |   |   | Annual MDA Program Review |      |   |   | Annual MDA Program Review |      |   |   | Annual MDA Program Review |  |  |  |  |
| APB I&T, Certification APB-07            | ■    | ■ |   |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| APB-09                                   | ■    | ■ | ■ | ■                         |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| APB-11                                   |      |   |   |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| APB-13                                   |      |   |   |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| APB-15                                   |      |   |   |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| Development, I&T Certification TI-08     | ■    | ■ | ■ |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| TI-10                                    | ■    | ■ | ■ | ■                         |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| TI-12                                    |      |   |   |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| TI-14                                    |      |   |   |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| TI-16                                    |      |   |   |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| Common Weapon Launcher (CWL) Development | ■    | ■ | ■ | ■                         |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| Test & Evaluation Milestones             |      |   |   |                           |  |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |      |   |   |                           |  |  |  |  |
| DT / FOT&E AN/BYG-1                      |      |   |   | ▲ TI-08 APB-07 (DT/OT)    |  |   |   | △ APB-09 (DT/OT)          |      |   |   | △ TI-10 (DT/OT)           |      |   |   | △ APB-11 (DT/OT)          |      |   |   | △ TI-12 (DT/OT)           |      |   |   | △ APB-13 (DT/OT)          |      |   |   | △ TI-14 (DT/OT)           |  |  |  |  |

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|---|---|---|----------------------------|
| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2011 Navy   |   |   | <b>DATE:</b> February 2010 |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604562N: <i>Submarine Tactical Warfare System</i> | <b>PROJECT</b><br>0236: <i>SSN Comb Cont Sys Imprvmnt (ENG)</i> |                            |

## Schedule Details

| Event  | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| Common Weapon Launcher - Development             | 1       | 2009 | 4       | 2010 |
| AN/BYG-1 APB07 Integration & Test, Certification | 1       | 2009 | 1       | 2009 |
| AN/BYG-1 TI08 - Development                      | 1       | 2009 | 3       | 2010 |
| AN/BYG-1 APB07/TI08 DT/OT                        | 4       | 2009 | 1       | 2010 |
| AN/BYG-1 APB09 Integration & Test, Certification | 1       | 2009 | 3       | 2010 |
| AN/BYG-1 APB09 MDA Review                        | 4       | 2009 | 4       | 2009 |
| AN/BYG-1 APB09 DT/OT                             | 4       | 2010 | 1       | 2011 |
| AN/BYG-1 TI10 Development                        | 1       | 2009 | 3       | 2011 |
| AN/BYG-1 TI10 DT/OT                              | 4       | 2011 | 1       | 2012 |
| AN/BYG-1 APB11 Integration & Test, Certification | 4       | 2010 | 3       | 2012 |
| AN/BYG-1 APB11 DT/OT                             | 4       | 2012 | 1       | 2013 |
| AN/BYG-1 TI12 Development                        | 4       | 2010 | 3       | 2013 |
| AN/BYG-1 TI12 DT/OT                              | 4       | 2013 | 1       | 2014 |
| AN/BYG-1 APB13 Integration & Test, Certification | 4       | 2012 | 3       | 2014 |
| AN/BYG-1 APB13 DT/OT                             | 4       | 2014 | 1       | 2015 |
| AN/BYG-1 TI14 Development                        | 4       | 2012 | 3       | 2015 |
| AN/BYG-1 APB15 Integration & Test, Certification | 4       | 2014 | 4       | 2015 |
| AN/BYG-1 TI16 Development                        | 4       | 2014 | 4       | 2015 |

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|--|-----------------------|-------------------------|------------------------------|---|-------------------------------|-------------------------|-------------------------|---|-------------------------|-------------------------|-------------------|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy   |                       |                         |                              |   |                               |                         |                         | <b>DATE:</b> February 2010                        |                         |                         |                   |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i>  |                       |                         |                              | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604562N: <i>Submarine Tactical Warfare System</i> |                               |                         |                         | <b>PROJECT</b><br>9999: <i>Congressional Adds</i> |                         |                         |                   |
| <b>COST (\$ in Millions)</b>   | <b>FY 2009 Actual</b> | <b>FY 2010 Estimate</b> | <b>FY 2011 Base Estimate</b> | <b>FY 2011 OCO Estimate</b>   | <b>FY 2011 Total Estimate</b> | <b>FY 2012 Estimate</b> | <b>FY 2013 Estimate</b> | <b>FY 2014 Estimate</b>                           | <b>FY 2015 Estimate</b> | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 9999: <i>Congressional Adds</i>  | 7.978                 | 7.569                   | 0.000                        | 0.000   | 0.000                         | 0.000                   | 0.000                   | 0.000   | 0.000                   | 0.000                   | 27.406            |
| Quantity of RDT&E Articles   | 0                     | 0                       | 0                            | 0   | 0                             | 0                       | 0                       | 0   | 0                       |                         |                   |
| <b>A. Mission Description and Budget Item Justification</b><br>Congressional Adds.   |                       |                         |                              |   |                               |                         |                         |   |                         |                         |                   |
| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>   |                       |                         |                              |   |                               |                         |                         |   |                         |                         |                   |
|  |                       |                         |                              |   |                               |                         | <b>FY 2009</b>          | <b>FY 2010</b>                                    |                         |                         |                   |
| Congressional Add: Artificial Intelligence-Based Combat System Kernel  |                       |                         |                              |   |                               |                         | 0.000                   | 3.187   |                         |                         |                   |
| <i>FY 2010 Plans:</i><br>The congressional add will be used to incorporate a mission focused, decision-tailored Command Decision Support System (CDSS) with a CANES-compliant and COTS-based Services Oriented Architecture framework, which will enable optimized manning through the introduction of Intelligent Agent-Based automation, advanced visualization, and emerging collaboration technologies.  |                       |                         |                              |   |                               |                         |                         |   |                         |                         |                   |
| Congressional Add: Submarine System Biometrics Access Control  |                       |                         |                              |   |                               |                         | 0.000                   | 1.992   |                         |                         |                   |
| <i>FY 2010 Plans:</i><br>This congressional add will use properly configured biometrics systems, engineered into tactical system workstations and submarine ship infrastructure, that will offer the ability for systems to reliably recognize users without user intervention, resulting in rapid, automatic, secure system access for the varying levels of system capabilities, based on user privileges. |                       |                         |                              |   |                               |                         |                         |   |                         |                         |                   |
| Congressional Add: SUBMARINE MAINTENANCE AUTOMATION AND COMMUNICATION  |                       |                         |                              |   |                               |                         | 1.596                   | 0.000   |                         |                         |                   |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy  |   | <b>DATE:</b> February 2010                        |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i>   | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604562N: <i>Submarine Tactical Warfare System</i> | <b>PROJECT</b><br>9999: <i>Congressional Adds</i> |
| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>  |   |   |
|   | <b>FY 2009</b>  | <b>FY 2010</b>                                    |
| <i>FY 2009 Accomplishments:</i><br>The congressional add will be used to expand the Submarine Maintenance Free Operating Period (MFOP) effort, designed to automate scheduled preventive maintenance events, potentially reducing the weekly allocation of man-hours dedicated to maintenance.  |   |   |
| Congressional Add: Advanced Tactical Control System<br><br><i>FY 2009 Accomplishments:</i><br>The Congressional add automatically fuses contact data to provide the commanding officer and crew a clear and accurate tactical picture. This will enable the submarine commanding officer and crew to make better, faster tactical decisions while at sea.   | 1.596   | 0.000   |
| Congressional Add: Submarine Environment for Evaluation and Developme<br><br><i>FY 2009 Accomplishments:</i><br>The congressional add will provide a low-cost test bed for industry and academia to create and evaluate innovative ideas and to integrate their products into currently deployed and conceptual systems.<br><br><i>FY 2010 Plans:</i><br>N/A  | 2.393   | 2.390   |
| Congressional Add: Water Space Management Navigation Decision Aid<br><br><i>FY 2009 Accomplishments:</i><br>The congressional add will provide navigational decision aide and message editor that automatically drafts standard US Navy submarine planning and asset assignment messages (e.g., SUBNOTES, OPSKDS, MODUS) for transmission, but also converts these messages into 2-dimensional and 3- | 2.393   | 0.000   |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Navy  |   | <b>DATE:</b> February 2010                        |                |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604562N: <i>Submarine Tactical Warfare System</i> | <b>PROJECT</b><br>9999: <i>Congressional Adds</i> |                |
| <b><u>B. Accomplishments/Planned Program (\$ in Millions)</u></b>   |   |   |                |
|   |   | <b>FY 2009</b>                                    | <b>FY 2010</b> |
| dimensional graphic renderings of an asset's waterspace for enhanced navigational awareness and contact avoidance.  |   |   |                |
| Congressional Adds Subtotals  |   | 7.978   | 7.569          |
| <b><u>C. Other Program Funding Summary (\$ in Millions)</u></b><br>N/A  |   |   |                |
| <b><u>D. Acquisition Strategy</u></b><br>N/A  |   |   |                |
| <b><u>E. Performance Metrics</u></b><br>Congressional Adds.   |   |   |                |

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